In the Claims

Please amend as follows:

1. – 15. (Cancelled)

16. (Currently amended) ~~The method of claim 1~~ A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

depositing a first film layer on the substrate by a process that includes simultaneously:

(a) depositing a first material to a location on the substrate, and

(b) supplying energized ions of a second material different than the first material directed towards the first material to supply energy thereto and assisting growth of crystalline structure of the film layer during the deposition of the first material on the substrate;

forming an electrolyte second layer on the first layer; and

forming a third layer on the second layer, wherein providing the substrate includes forming a first contact layer on the substrate that at least partially separates the first layer from the substrate.

17. (Original) The method of claim 16, wherein providing the substrate includes forming a second contact layer on the substrate separate from the first contact layer.

18. – 19. (Cancelled)

20. (Currently amended) ~~The method of claim 19~~ A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

depositing a first film layer on the substrate by a process that includes simultaneously:

(a) depositing a first material to a location on the substrate, and

(b) supplying energized ions of a second material different than the first material directed towards the first material to supply energy thereto and assisting growth of crystalline structure of the film layer during the deposition of the first material on the substrate;

forming an electrolyte second layer on the first layer; and

forming a third layer on the second layer, wherein depositing the first layer includes depositing an intercalation material in the first layer to have a crystal orientation essentially perpendicular to a boundary between the first layer and the second layer, wherein depositing the intercalation first layer includes growing crystallite size of at least about 100 Angstroms.

21. (Currently amended) The method of claim ~~19~~ 20, wherein depositing the intercalation first layer includes growing crystallite size of at least about 200 Angstroms.

22. (Currently amended) The method of claim ~~19~~ 20, wherein depositing the intercalation first layer includes growing crystallite size of about 240 Angstroms.

23. (Original) The method of claim 22, wherein depositing the intercalation first layer includes depositing a $LiCoO_2$ material as the first layer.

24. (Original) The method of claim 23, wherein depositing the $LiCoO_2$ intercalation first layer includes depositing the $LiCoO_2$ intercalation first layer as a cathode layer.

25. – 64. (Cancelled)

65. (Original) A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

forming a seed film on the substrate;

forming a first film on the seed film by:

(a) depositing a first material to a location on the seed film, and

(b) supplying a second material different than the first material adjacent the location to control growth of a crystalline structure of the first material at the location;

forming an electrolyte second film on the first film; and

forming a third film on the electrolyte second film.

66. (Original) The method of claim 65, wherein forming the third film includes forming a second seed film on a surface of the electrolyte second film and thereafter forming the third film on the second seed film.

67. (Original) The method of claim 65, wherein forming the second seed film includes depositing a seed material having a surface free energy that is higher than a surface free energy of the third film.

68. (Original) The method of claim 66, wherein the third film includes a lithium intercalation material, and wherein forming the second seed film includes depositing an amorphous seed material to diminish undesirable growth structures of the lithium intercalation material of the third film.

69. (Original) The method of claim 66, wherein the third film includes a lithium intercalation material, and wherein forming the second seed film includes depositing a nanocrystalline seed material with fine grains to diminish undesirable growth structures of the lithium intercalation material of the third film.

70. (Original) The method of claim 66, wherein forming the second seed film includes depositing an electrically conductive seed material.

71. (Original) The method of claim 70, wherein depositing seed material includes

depositing a seed material comprising one or more of Ta, TaN, Cr, and CrN.

72. (Original) The method of claim 70, wherein depositing seed material includes depositing a seed material comprising one or more of, W, WN, Ru, and RuN.

73. (Original) The method of claim 65, wherein forming the seed film includes depositing a seed material having a surface free energy that is higher than a surface free energy of the first film.

74. (Original) The method of claim 65, wherein the first film includes a lithium intercalation material, and wherein forming the seed film includes depositing an amorphous seed material to diminish undesirable growth structures of the lithium intercalation material of the first film.

75. (Original) The method of claim 65, wherein the first film includes a lithium intercalation material, and wherein forming the seed film includes depositing a nanocrystalline seed material with fine grains to diminish undesirable growth structures of the lithium intercalation material of the first film.

76. (Original) The method of claim 65, wherein forming the seed film includes depositing an electrically conductive seed material.

77. (Original) The method of claim 76, wherein depositing seed material includes depositing a seed material comprising one or more of Ta, TaN, Cr, and CrN.

78. (Original) The method of claim 76, wherein depositing seed material includes depositing a seed material comprising one or more of, W, WN, Ru, and RuN.

79 - 100. (Cancelled)

101. (Previously Presented) A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

depositing a first layer on the substrate by:

(a) depositing a first material to a location on the substrate, and

(b) supplying energized particles of a second material different than the first material to the substrate adjacent the location to control growth of a crystalline structure of the first material at the location;

forming an electrolyte second layer on the first layer;

forming a third layer on the electrolyte second layer, and

after performing the above steps, cryogenically annealing the energy-storage device.

102. (Original) The method of claim 101, wherein supplying energized particles includes supplying energized ions.

103. (Original) The method of claim 102, wherein cryogenically annealing the energy-storage device includes exposing the energy-storage device to liquid nitrogen vapor.

104. (Original) The method of claim 102, wherein cryogenically annealing includes lowering the temperature of the energy-storage device to a near cryogenic temperature, then raising the temperature to a near deposition temperature, and then cooling the energy-storage device to an ambient temperature.

105. (Original) The method of claim 104, wherein the lowering, raising, and cooling steps are repeated.

106. (Original) The method of claim 104, wherein the lowering, raising, and cooling steps are repeated less than six times.

107. (Original) The method of claim 73, wherein cryogenically annealing includes first packaging the device prior to cryogenically annealing.

108. – 115. (Cancelled)

116. (Currently amended) ~~The method of claim 1~~ A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

depositing a first film layer on the substrate by a process that includes simultaneously:

(a) depositing a first material to a location on the substrate, and

(b) supplying energized ions of a second material different than the first material directed towards the first material to supply energy thereto and assisting growth of crystalline structure of the film layer during the deposition of the first material on the substrate;

forming an electrolyte second layer on the first layer; and

forming a third layer on the second layer,

wherein the substrate has a thermal degradation temperature of less than 700 degrees;

wherein the first layer is a first film,

wherein the first material is a first electrode material deposited using a deposition source;

wherein the supplying of the energized second material includes supplying particles energized above about 5 eV from a second source such that the particles provide energy to the first electrode material to deposit the first electrode material into a highly ordered crystal film;

wherein the electrolyte second layer is an electrolyte second film formed so as to be in contact with the first film;

wherein the third layer is a film that includes a second electrode material that iincludes an intercalation material; and

wherein the substrate is not subjected to a high temperature anneal.

117. (Cancelled)

118. (New) The method of claim 16, wherein depositing the first layer includes using physical vapor deposition to direct the first material to the location on the substrate.

119. (New) The method of claim 16, wherein the supplying the energized second material includes supplying ions having an energy within the range of about 5 to about 3000 eV.

120. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions from a source gas including O_2.

121. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions from a source gas including N_2.

122. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions from a source gas including a noble gas.

123. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions from a source gas including argon.

124. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions from a source gas including a hydrocarbon precursor.

125. (New) The method of claim 16, wherein supplying the energized second material includes focusing a beam of the ions at the location on the substrate.

126. (New) The method of claim 16, wherein supplying the energized second material includes supplying a non-focused beam of the ions.

127. (New) The method of claim 16, wherein supplying the energized second material

includes supplying ions having an energy within the range of about 5 eV to about 200 eV.

128. (New) The method of claim 16, wherein supplying the energized second material includes controlling stoichiometry of a growing film of first material.

129. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions having an energy within the range of about 10 eV to about 500 eV.

130. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions having an energy within the range of about 60 eV to about 150 eV.

131. (New) The method of claim 16, wherein supplying the energized second material includes supplying ions having an energy of about 140 eV.

132. (New) The method of claim 16, wherein at least the depositing of the first film using chemical vapor deposition to direct the first material toward the substrate.

133. (New) The method of claim 16, wherein at least the forming of the electrolyte second film includes using chemical vapor deposition to direct electrolyte material toward the substrate.

134. (New) The method of claim 16, wherein at least the forming of the third film includes using chemical vapor deposition to direct third film material toward the substrate.

135. (New) The method of claim 16, wherein depositing the first layer includes depositing an intercalation material in the first layer to have a crystal orientation essentially perpendicular to a boundary between the first layer and the second layer; and wherein forming the third layer includes forming an anode for a thin-film battery.

136. (New) The method of claim 16, wherein forming the electrolyte second layer on the

first layer includes depositing a fifth material to a location on the substrate and at least partially in contact with the first layer, and supplying energized ions of a sixth material different than the fifth material to the location on the substrate to form the electrolyte second layer.

137. (New) The method of claim 16, wherein forming the third layer on the electrolyte second layer includes depositing a third material to a second location at least partially in contact with the electrolyte second layer and separate from the first layer, and supplying energized ions of a fourth material different than the third material to the second location to control growth of a crystalline structure of the third material at the location to form the third layer.

138. (New) The method of claim 16, wherein supplying the energized second material includes supplying particles of the energized second material simultaneously with the first material but along a path that is not coincident with a path along which the first material travels.

139. (New) The method of claim 16, wherein supplying the energized second material includes supplying energized ions to the location on the substrate simultaneously with deposition of the first material.

140. (New) The method of claim 16, wherein providing the substrate includes providing a substrate having a thermal degradation temperature of less than 700 degrees Celsius.

141. (New) The method of claim 16, wherein providing the substrate includes providing a substrate having a thermal degradation temperature of less than about 300 degrees Celsius.

142. (New) The method of claim 16, wherein providing the substrate includes providing a substrate having a thermal degradation temperature of less than about 250 degrees Celsius.

143. (New) The method of claim 16, wherein the supplying the energized second material includes controlling growth of the first material into a crystalline structure.

144. (New) The method of claim 16, wherein the supplying of the energized second material includes supplying energized ions.

145. (New) A method of fabricating a solid-state energy-storage device, comprising:

providing a substrate;

forming a seed film on the substrate;

depositing a first film layer on the seed film by a process that includes simultaneously:

(a) depositing a first material to a location on the substrate, and

(b) supplying energized ions of a second material different than the first material directed towards the first material to supply energy thereto and assisting growth of crystalline structure of the film layer during the deposition of the first material on the substrate;

forming an electrolyte second layer on the first layer; and

forming a third layer on the second layer, wherein providing the substrate includes providing a substrate having a first contact layer on the substrate.

146. (New) An apparatus comprising:

means for providing a substrate;

means for forming a first seed film on the substrate;

means for forming a first film on the seed film by:

(a) depositing a first material to a location on the first seed film, and

(b) supplying a second material different than the first material adjacent the location to control growth of a crystalline structure of the first material at the location;

means for forming an electrolyte second film on the first film; and

means for forming a third film on the electrolyte second film.

147. (New) The apparatus of claim 146, wherein the means for forming the third film

includes means for forming a second seed film on a surface of the electrolyte second film and thereafter forming the third film on the second seed film.

148. (New) The apparatus of claim 146, wherein means for forming the second seed film includes depositing a seed material having a surface free energy that is higher than a surface free energy of the third film.

149. (New) The apparatus of claim 147, wherein the third film includes a lithium intercalation material, and wherein the means for forming the second seed film includes means for depositing an amorphous seed material to diminish undesirable growth structures of the lithium intercalation material of the third film.

150. (New) The apparatus of claim 147, wherein the third film includes a lithium intercalation material, and wherein the means for forming the second seed film includes means for depositing a nanocrystalline seed material with fine grains to diminish undesirable growth structures of the lithium intercalation material of the third film.

151. (New) The apparatus of claim 147, wherein the means for forming the second seed film includes means for depositing an electrically conductive seed material.

152. (New) The apparatus of claim 151, wherein the means for depositing seed material of the second seed film includes means for depositing a seed material comprising one or more of Ta and TaN.

153. (New) The apparatus of claim 151, wherein the means for depositing seed material of the second seed film includes means for depositing a seed material comprising one or more of Cr, and CrN.

154. (New) The apparatus of claim 151, wherein the means for depositing seed

material of the second seed film includes means for depositing a seed material comprising one or more of W and WN.

155. (New) The apparatus of claim 151, wherein the means for depositing seed material of the second seed film includes means for depositing a seed material comprising one or more of Ru, and RuN.

156. (New) The apparatus of claim 147, wherein the means for forming the seed film includes means for depositing a seed material having a surface free energy that is higher than a surface free energy of the first film.

157. (New) The apparatus of claim 147, wherein the first film includes a lithium intercalation material, and wherein the means for forming the seed film includes means for depositing an amorphous seed material to diminish undesirable growth structures of the lithium intercalation material of the first film.

158. (New) The apparatus of claim 147, wherein the first film includes a lithium intercalation material, and wherein the means for forming the seed film includes means for depositing a nanocrystalline seed material with fine grains to diminish undesirable growth structures of the lithium intercalation material of the first film.

159. (New) The apparatus of claim 147, wherein the means for forming the first seed film includes means for depositing an electrically conductive seed material.

160. (New) The apparatus of claim 158, wherein the means for depositing seed material of the first seed film includes means for depositing a seed material comprising one or more of Ta, TaN, Cr, and CrN.

161. (New) The apparatus of claim 158, wherein the means for depositing seed

material of the first seed film includes means for depositing a seed material comprising one or more of W, WN, Ru, and RuN.

162. (New) The method of claim 20, wherein depositing the first layer includes using physical vapor deposition to direct the first material to the location on the substrate.

163. (New) The method of claim 20, wherein the supplying the energized second material includes supplying ions having an energy within the range of about 5 to about 3000 eV.

164. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions from a source gas including O_2.

165. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions from a source gas including N_2.

166. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions from a source gas including a noble gas.

167. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions from a source gas including argon.

168. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions from a source gas including a hydrocarbon precursor.

169. (New) The method of claim 20, wherein supplying the energized second material includes focusing a beam of the ions at the location on the substrate.

170. (New) The method of claim 20, wherein supplying the energized second material includes supplying a non-focused beam of the ions.

171. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions having an energy within the range of about 5 eV to about 200 eV.

172. (New) The method of claim 20, wherein supplying the energized second material includes controlling stoichiometry of a growing film of first material.

173. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions having an energy within the range of about 10 eV to about 500 eV.

174. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions having an energy within the range of about 60 eV to about 150 eV.

175. (New) The method of claim 20, wherein supplying the energized second material includes supplying ions having an energy of about 140 eV.

176. (New) The method of claim 20, wherein at least the depositing of the first film using chemical vapor deposition to direct the first material toward the substrate.

177. (New) The method of claim 20, wherein at least the forming of the electrolyte second film includes using chemical vapor deposition to direct electrolyte material toward the substrate.

178. (New) The method of claim 20, wherein at least the forming of the third film includes using chemical vapor deposition to direct third film material toward the substrate.

179. (New) The method of claim 20, wherein depositing the first layer includes depositing an intercalation material in the first layer to have a crystal orientation essentially perpendicular to a boundary between the first layer and the second layer.

180. (New) The method of claim 20, wherein forming the electrolyte second layer on the

first layer includes depositing a fifth material to a location on the substrate and at least partially in contact with the first layer, and supplying energized ions of a sixth material different than the fifth material to the location on the substrate to form the electrolyte second layer.

181. (New) The method of claim 20, wherein forming the third layer on the electrolyte second layer includes depositing a third material to a second location at least partially in contact with the electrolyte second layer and separate from the first layer, and supplying energized ions of a fourth material different than the third material to the second location to control growth of a crystalline structure of the third material at the location to form the third layer.

182. (New) The method of claim 20, wherein supplying the energized second material includes supplying particles of the energized second material simultaneously with the first material but along a path that is not coincident with a path along which the first material travels.

183. (New) The method of claim 116, wherein providing the substrate includes providing a substrate having a seed film thereon.

184. (New) The method of claim 116, wherein supplying the energized second material includes focusing a beam of the ions at the location on the substrate.

185. (New) The method of claim 116, wherein supplying the energized second material includes supplying a non-focused beam of the ions.

186. (New) The method of claim 116, wherein supplying the energized second material includes controlling stoichiometry of a growing film of first material.

187. (New) The method of claim 116, wherein at least the depositing of the first film using chemical vapor deposition to direct the first material toward the substrate.

188. (New) The method of claim 116, wherein at least the forming of the electrolyte second film includes using chemical vapor deposition to direct electrolyte material toward the substrate.

189. (New) The method of claim 116, wherein at least the forming of the third film includes using chemical vapor deposition to direct third film material toward the substrate.

190. (New) The method of claim 116, wherein the device is a thin-film lithium battery.

191. (New) The method of claim 16, wherein the device is a thin-film lithium battery.

192. (New) The method of claim 20, wherein the device is a thin-film lithium battery.

193. (New) The method of claim 65, wherein the device is a thin-film lithium battery.

194. (New) The method of claim 101, wherein the device is a thin-film lithium battery.

195. (New) The apparatus of claim 147, wherein the device is a thin-film lithium battery.